

PLANNING COMMISSION MEETING  
City of Gardner, Kansas  
Council Chambers  
September 27, 2021  
7 p.m.

**CALL TO ORDER**

The meeting of the Gardner Planning Commission was called to order at 7:00 p.m. on Monday, September 27, 2021, by Chairman Scott Boden.

**PLEDGE OF ALLEGIANCE**

Chairman Boden led the Pledge of Allegiance.

**ROLL CALL**

Chairman Boden  
Commissioner Ham  
Commissioner Meder- Absent  
Commissioner McNeer  
Commissioner Jueneman  
Commissioner Cooper  
Commissioner Hansen

Staff members present:

David Knopick, Community Development Director  
Robert Case, Principal Planner  
Melissa Krayca, Administrative Assistant  
Spencer Low, City Attorney

**CONSENT AGENDA**

**1. Approval of the minutes as written for the meeting on August 23, 2021.**

**Motion made by Commissioner McNeer to approve the minutes, seconded by Commissioner Jueneman passed 6-0.**

**REGULAR AGENDA**

- 1. TALLGRASS, 2<sup>ND</sup> PHASE**
  - a. FINAL PLAT**
  - b. FINAL DEVELOPMENT PLAN**

**STAFF PRESENTATION**

Mr. Case, Principal Planner presented the information in the staff report for Tallgrass Final Plat 2<sup>nd</sup> Plat. The original development was approved in 2019 and the current plat consists of 3 lots. The final plat is consistent with the preliminary plat and the Land Development Code and consistent with the established goals and policies of the City. No adjustments or deviations are requested with this plat. Staff recommends approval of the final plat for Tallgrass 2<sup>nd</sup> plat with the conditions outlined in the recommended motion.

**COMMISSION DISCUSSION**

No Discussion.

Motion made after review of application FP-21-06, a final plat for Tallgrass, 2<sup>nd</sup> Plat, tax Id CP94500000 0T0C, and staff report dated September 27, 2021, the Planning Commission approves the application as proposed, provided the following conditions are met:

1. Prior to the issuance of a building permit, the application shall obtain approval from the Johnson County Board of Commissioners.
2. Prior to the Mayor signing an approved recordable plat, the applicable excise tax shall be paid to the City.
3. The construction plans for any utilities, infrastructure, or public facilities shall meet all technical specifications and public improvement plans shall be submitted and approved prior to the release of the plat for recording.

and forwards the recommendation for approval to the Governing Body.

Motion made by Commissioner McNeer and seconded by Commissioner Ham.

Motion passed 6-0.

### **STAFF PRESENTATION**

Mr. Case presented the information in the staff report for Tallgrass 2<sup>nd</sup> Plat, Final Development Plan. The Plan consists of 7 buildings with 136 units and 2 duplex homes with 4 units. There will be 5.2 acres of open space including a sports court, internal trail system, and clubhouse with a pool. The final development plan is consistent with the preliminary development plan and the site is capable of accommodating the buildings and other site design elements. The architecture and materials provide for quality buildings and the overall design is compatible with the context considering the location near residential and commercial properties. Staff recommends approval of the final development plan for Tallgrass, 2<sup>nd</sup> plat subject to the conditions outlined in the recommended motion.

### **COMMISSION DISCUSSION**

Commissioner Jueneman inquired about the plans on the east side of the development, specifically a parking lot shown outside of the development plan. Todd Allenbrand, Payne, and Brockway explained the lot is for future apartment buildings in a future phase of the project and is shown for context.

Motion made after review of application FDP-21-07, a final development plan for Tallgrass, 2<sup>nd</sup> Plat, tax Id CP94500000 0T0C, and staff report dated September 27, 2021, The Planning Commission approves the application as proposed, provided the following conditions are met.

1. Prior to the issuance of a building permit, the application shall obtain approval from the Johnson County Board of Commissioners.
2. Approval of the final plat for Tallgrass, 2<sup>nd</sup> Plat.

and forwards the recommendation for approval to the Governing Body.

Motion made by Commissioner Hansen and seconded by Commissioner McNeer.

Motion passed 6-0.

## **2. GARDNER LAND DEVELOPMENT CODE AMENDMENT-OFF SITE SIGNAGE (PUBLIC HEARING)**

### **STAFF PRESENTATION**

Dave Knopick, Community Development Director presented the information in the staff report for the proposed code amendments. Periodically the Governing Body or Planning Commission or staff, through the activities associated with the administration of Title 17 Land Development Code (LDC) of the Gardner Municipal Code, may identify the need to make text amendments to the LDC. The process was initiated by the governing body on June 7, 2021, and introduced to the Planning Commission on August 23, 2021. The city attorney has conducted a review and revisions have been made and incorporated into the draft proposed. The City of Gardner can be more restrictive but not less restrictive than state regulations but can be less or more restrictive than Johnson County standards. An outline of the proposed amendments are as follows:

#### Chapter 17.10 Sign Standards

##### Principal Use Signs

- Allowed in C-2/ C-3/ M-1/ M-2 districts
- Allowed on property abutting/adjacent to I-35
- Not allowed along interchange ramps; acceleration/deceleration lanes; or for 500 ft beyond such lanes
- Vehicular access must be provided from the nearest roadway other than I-35
- Maximum number – 1 per parcel
- Separation between principal use signs
  - 600 feet for non-electric / digital LED signs
  - 1000 feet for electric / digital / LED signs
  - Measure along the I-35 centerline
- Total Display Area- 750 square feet
- Maximum Dimensions- 15 feet high and 50 feet wide
- Maximum Height- 30 feet
- Setbacks
  - 50 feet from I-35 right-of-way
  - 500 feet from property zoned residential for non-electric /digital / LED signs
- Type- Monument or Pole
- Lighting
  - No flashing, intermittent, or moving lights
  - Direct / Indirect lighting sources shall be shielded in a manner that directs light to the sign face only, prevents the light source from being visible when looking at the sign, and prevents glare.
  - Electronic / Digital / LED signs must display a static image for a minimum of 10 seconds between changes in display and no more than two seconds for transitions. No scrolling, flashing or animated transitions shall occur. Automatic dimming controls shall limit the illumination to no more than 500 nits at the sign surface at night or during low light times, and no more than 5,000 nits at the brightest daylight period.
- Construction / Maintenance
  - An initial building/sign permit is required and plans provided with applications for permitting such sign shall be certified by a licensed engineer registered in the State of Kansas.
  - Construction shall be in accordance with industry-wide standards and the adopted building regulations of the City of Gardner.

- Maintenance activities shall ensure that the sign is structurally sound and in good condition and that the property is maintained in compliance with the adopted regulations of the City of Gardner.
- Sign permits for such signs shall be renewed every 5 years through the filing of a sign permit renewal application and a certified inspection report provided by a licensed engineer registered in the State of Kansas verifying the sign is structurally sound and in good condition.
- Subject to all other applicable state/federal regulations
- Removal of 17.10.050 K. – Standards Applicable to All Signs

*Any sign with a business message shall be located on the site of the business activity.*

Staff recommendation is to conduct a public hearing, discuss proposed amendments and make a recommendation to the Governing Body. Motion options are as follows:

### **PUBLIC HEARING**

Lynn Baker, L & J Development, LLC presented a letter to the planning commission members and vocalized his concerns with the proposed amendments. Mr. Baker does not agree with allowing only 1 sign per parcel of land considering he owns 82 acres alongside I-35. He believes the distance between signs should govern the sign count. He also stated that the 30-foot maximum height is too restrictive and signs could be obstructed by the trees. Mr. Baker also would like to donate some of the lands to the city to construct a Welcome to Gardner monument sign on the highway exit. Mr. Baker stated his appreciation for the staff's work and the consideration of the planning commission as well.

Jason Camis, Chamber of Commerce expressed his concerns with limitations being proposed as well. A standard of 50 feet for billboards would provide a better range of view on I-35 and a distance limitation would better suit landowners and businesses. He would request that the setback rule be enforced on a case-by-case basis depending on the surrounding land development and trees that may be able to be saved. He has reached out to developers and owners in the community that would like to see more billboards allowed that would present the opportunity to promote local business.

Fred Wingert, Wingert Billboard Company said he had received requests from business owners about revising billboard statues and his company is receiving more requests for business as well. He presented several letters to the commissioners from people who are requesting consideration to the topic. He said that he agrees with the proposed amendments except for 3 things. The number of signs per parcel, overall height, and setback being 50 feet from the highway. The state of Kansas or Johnson County does not have such tight restrictions and the possible proliferation of billboards would be addressed by the requirement of 600 and/or feet between signs. The proposed amendments are 40% less in height than the State which allows 50 feet. The proposed 50 feet minimum setback would place a burden on landowners who will not want a sign in the middle of their property and take away commercial and industrial land from future use. He asked the commissioners to consider the amendments but not implement the restrictions of the number of signs per parcel, reduce the setback and increase sign height to 50 feet.

**Motion made to close the public hearing by Commissioner McNeer and seconded by Commissioner Hansen.**

**Motion passed 6-0.**

### **COMMISSION DISCUSSION**

Commissioner Ham stated her concern for the growing population buying homes in Gardner and being sure that billboards would not hinder the trail system. She would like to see the difference between 30 and 50-foot signs.

Mr. Knopick indicated that the Hampton Inn is approximately 62 feet tall and could be used as a reference when considering a 50 foot high sign. He believes the height can be flexible as long as we are sensitive to residential areas.

Commissioner Hansen said it made sense to him to require the separation distance rather than 1 sign per parcel.

Mr. Knopick agreed that it could be removed after hearing the comments in the public hearing.

Commissioner McNeer asked if reducing visibility with 30-foot signs and increased 50-foot setback would create any safety concerns.

Mr. Wingert says there is no question the signs are easier to read at 50 feet and closer to the highway but there is no data to prove they are unsafe.

Commissioner Jueneman asked if there is any differentiation in the proposed amendments in setbacks for digital signs.

Mr. Knopick said there is not and also clarified that there is room to give on the proposed setback of 50 feet. The intention is to be consistent with the Johnson County standards but staff wouldn't be opposed to the 15 feet setback. The only concern is any potential for expansion work in the right-of-ways.

Mr. Jueneman commented he drives a lot for work and noticed a spot in MO along I-29 that had many signs and stated his preference of farmland as opposed to billboards.

Commissioner Cooper asked approximately how many signs could be erected along I-35 in Gardner within the zoning restrictions.

Mr. Wingert said there seem to be only 3 potential locations.

Mr. Knopick agreed with that number but would need to be verified with field measurements and applicable zoning.

Chairman Boden commented that a great deal of information has been presented and would like some more time to make solid decisions on creating new code. He tends to favor the property owner's right to decide and thinks the proposed amendments are restrictive.

Mr. Baker commented that his property has red cedars about 30 ft from the highway and would hate to have to cut the trees for sign placement.

After hearing the discussion, Mr. Knopick stated he is comfortable removing the 1 sign per parcel and changing the setback to 15 feet instead of 50 feet. He recommended that we consider requiring a conditional use permit when a sign is to exceed 30 feet in height as a way to review the context and potentially approve on a case-by-case basis. It would provide a way to take topography and possible future development into account.

Commissioner McNeer asked if it would be reasonable to table the issue until the next meeting.

Mr. Knopick said he would be able to prepare something for the next meeting.

Commissioner Ham asked if there were requirements for landscaping around pole signs.

Mr. Knopick stated there are currently requirements for landscaping around monument and pole signs and those would be applicable to principal use signs.

**Motion made to table the item until October 25, 2021, by Commissioner McNeer and seconded by Commissioner Ham.**

**Motion passed 6-0.**

## DISCUSSION ITEMS

Mr. Knopick asked commissioners to take a look at their calendars in November and December and let him know if meeting dates are problematic due to the holidays. He will look at the possibility of adjusting meeting dates if needed.

Chairman Boden announced that this may be his last meeting as his family is moving out of state. He has enjoyed being part of the Planning Commission and hates to leave. Commissioner Hansen thanked the Chairman for his leadership and experience. Commissioner Ham concurred. Commissioner McNeer complimented his support of all members over the years and his exceptionally well-managed and controlled meetings. Mr. Knopick stated his appreciation for how Chairman Boden has managed meetings. Mr. Case thanked him for his insight, leadership, and willingness to learn the codes.

**Motion made to adjourn by Commissioner McNeer and seconded by Commissioner Hansen.**

**Motion passed 6-0.**

**Meeting adjourned at 8:30 p.m.**

Recording of the meeting can be found at:  
<https://www.youtube.com/watch?v=67xA33iEzfc&t=3487s>

## REQUESTED CHANGES TO PROPOSED REGULATIONS:

### 10. Principal use sign dimensions and setbacks:

#### a. Number of principal use signs per parcel – 1

- The state of Kansas has no such restriction on signs per parcel.
- Johnson County has no such restriction on signs per parcel.
- This is addressed by requiring 600 feet and/or 1,000 feet between signs.
- Lack of fairness to those that own more frontage.
- Request to delete.

#### e. Overall height – 30 feet maximum

- 40% more restrictive than the State of Kansas.
- State of Kansas allows 50 feet.
- Signs can't be seen from highway if they are 30 feet tall.
- Request change to 50 feet maximum height.

#### f. Setback from I-35 right-of-way – 50 feet minimum

- The state of Kansas requires no minimum set-back from right of way.
- This is a huge burden on landowners who will not want a sign in the middle of their property.
- Restriction takes away value commercial and industrial land from future use.
- Request to change to 15 feet set-back as was proposed in the August Planning Commission Meeting, Monday August 23, 2021

**L & J DEVELOPMENT, LLC**  
**Lynn Baker, Cell 913-486-2555**  
**23173 OLD KC RD, SPRING HILL, KS 66083**

Monday September 27, 2021

Scott Boden, Chair  
Mia Ham  
Eric Hansen  
Austin Jueneman  
Adrianna Meder  
Steve McNeer  
Stacy Cooper

Dear Planning Commission Members:

Thank you for your service to Gardner. In August 2019, we agreed to have the 82 acres of development land we own and operate at 199th and I-35 annexed into the City of Gardner. We are working on various proposals to develop this property. Our development is one of the largest single tracts of land to be developed with frontage on I-35 in the City of Gardner. We appreciate the ongoing relationship we have with the City Manager, the City Planning Department, the Planning Commission, and the City Council.

I have reviewed the new proposed billboard regulations posted September 27, 2021 Gardner Planning Meeting Agenda. While in general the regulations seem ok and we support them. We find the following restrictions for billboards to be extremely unfair to all Gardner Kansas Commercial/Industrial Landowners:

- 1) Only allowing one billboard sign per parcel is EXTREMELY UNFAIR. Why does my company who agreed to be annexed into the City of Gardner in 2019, now be restricted to having only one billboard sign? These proposed regulations ALREADY restrict how close billboards can be to residential areas (no closer than 500 feet). These proposed regulations ALREADY require signs to be either 600 feet or 1000 feet from each other. These large limitations are adequate to keep Gardner, Kansas being overrun by billboards. There should be no limitation on the number of signs per property.



- 2) Requiring signs to have a set back of 50 feet from the I-35 right of way is not in the best of Gardner, Kansas. You are taking away commercial property which we can build roads or buildings on.
- 3) The purpose of billboard signs is so they can be seen by the traveling public. Limiting their height to 30 feet isn't reasonable.

On another topic, we would like to work with the City of Gardner to have a "Welcome to Gardner" in the corner of our property. Our property is the first property on I-35 in the City of Gardner as you approach from the south. Many cities have these and we have a perfect location for such a "Welcome to Gardner Kansas sign" on the corner of our property.

Thanks for your service to Gardner.

Sincerely,

A handwritten signature in cursive script, appearing to read "Lynn Baker".

Lynn Baker, Co-Owner

**Ron Stricker's Auction  
790 North Center St  
Gardner, Kansas  
913-963-3800**

September 24th, 2021

City of Gardner Planning Office  
City of Gardner Planning Commission  
120 E Main St,  
Gardner, KS 66030

Dear Commissioners:

I have been made aware that you may be considering a proposal to approve additional billboards on I-35. Please vote to approve more billboards signs on I-35 in the City of Gardner.

My company has used billboards to advertise and inform customers about our auction, and auctioneering services over the last 20 years. Billboards add value to businesses and organizations in the community. Thousands of people from other communities in Kansas and across the United States drive by our city each day. Additional billboards are one way to promote businesses and organizations in our city.

Sincerely,



Ron Stricker  
Cell 913-963-3800



**QuikTrip**

KANSAS CITY DIVISION  
5725 Foxridge Drive  
Mission, KS 66202-2401  
P.O. Box 220  
Shawnee Mission, KS 66201-0220  
913-362-3700  
FAX: 918-994-3557

David Knopick, Community Development Director  
City of Gardner Kansas  
120 E. Main St.  
Gardner, KS 66030

Dear David:

As you are aware, QuikTrip Corporation is building a new Travel Plaza in Gardner at I-35 and Gardner Road. We understand that you are considering approving a change in your billboard rules to allow a few billboards within the Gardner City Limits both north and south of the Gardner Road Exit.

There is a challenge right now for our business finding available billboard space on I-35 both north and south of our location. For a location like the one we are building in Gardner, we have utilized billboard signage to inform the public about access to the services we provide. We would support your approval of adding a few billboard signs on I-35.

My email address is [jacord@quiktrip.com](mailto:jacord@quiktrip.com) if I can be of assistance. Thank you for your consideration.

Sincerely,

Jason Acord  
Director of Real Estate



1845 E Santa Fe  
Olathe, KS 66062  
Parts: 855-890-2063  
Service: 855-890-1832  
[www.olatheford.com](http://www.olatheford.com)

Sep 22, 2021

Mayor Steve Shute  
Mark Baldwin  
Kacy Deaton  
Randy Gregorcyk  
Tory Roberts  
Todd Winters

Dear Gardner City Council Members:

For the last 33 years, Olathe Ford RV Center has worked to build our reputation as Kansas City's largest Recreational Vehicle Dealer. We strive to be a responsible and supportive member of Gardner and Johnson County. We offer services which include sales, service, parts, accessories, storage, rentals, and body repairs. To grow and attract new customers, we have in the past and may potentially in the future use billboard signage. In particular, I-35 billboard signage would be valuable to growing our business.

We would support the Gardner City Council adding additional billboard signage and electronic billboards along I-35 within the city limits.

We appreciate the service and sacrifice you make to serve our community on the council. Thank you for your consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "J McEver", with a long horizontal line extending to the right.

Jeremy McEver,  
VP



September 24, 2021

Mr. David Knopick  
Community Development Director  
120 E Main St  
Gardner, KS 66030

Re: Billboard signage considerations for Interstate 35 corridor

Dear Mr. Knopick,

We were recently made aware of your consideration for the allowance of some billboard signage along the I-35 corridor between the 175<sup>th</sup> Street and Homestead Lane exits. As an employer based in Gardner, KS we are routinely seeking ways in which to advertise our career opportunities and open positions to the public. The high traffic count of commuters and travelers on the I-35 corridor presents an excellent opportunity to promote local business and career opportunities such as those offered at BCI Mechanical, Inc.

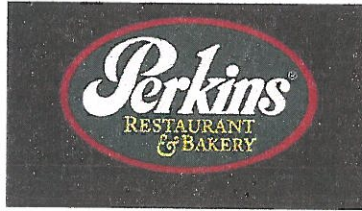
I would ask that the Planning Commission and further the Mayor and City Council please give due consideration to the allowance of a feasible number of billboards between these (2) entry and exit points. The ability to advertise career opportunities while passing through our great community would only help to further enhance our opportunities to grow our business, the community, and the services offered within.

Please feel free to contact me should you have any questions regarding my support for these billboards. I may be reached on cell at 913-207-7528.

Sincerely,



Brandon Livingston, PE  
President



**2000 E. SANTA FE  
GARDNER, KS 66030**

City of Gardner City Commissioner:  
Mayor Steve Shute  
120 E Main Street  
Gardner, KS 66030

Dear Gardner City Commissioners:

I am writing to request your support of policies to add some additional billboards south of Gardner on Interstate 35. The restaurant business and all travel related industry has faced many challenges since mid-March 2020. These challenges will continue for the foreseeable future. We continue as an industry to adapt and evolve in order to survive in these challenging times.

As a company and franchisee, we have utilized and will continue to utilize billboard signage to promote our products to the travel public on I-35 in the Gardner area. Especially in these difficult times, we would strongly support any effort to add additional billboards on I-35 near Gardner. While we can understand that the city may not want large numbers of billboards, adding a few billboards would assist our business. As our business grows, there is a need to hire more local personnel to fill the job requirements.

We appreciate your time, commitment, and service to the Gardner, Kansas community. I can be reached at the number below if you have time to call.

Thank you.

  
Vince Walsh

Cyhawk Hospitality, Inc./Perkins Restaurant  
Outdoor Advertising Consultant

Red Brick Inv. LLC

**Brown Stone 3 Development, LLC**  
**2955 SW Wanamaker Dr.**  
**Topeka, Kansas 66614**  
**785.329.5420**

**Council Members: Mark Baldwin, Randy Gregorcyk, Rich Melton  
Tory Roberts, Todd Winters**

**Mayor Steve Shute**

**Dear Gardner City Officials:**

**Our company is developing a commercial/retail project which will bring several new businesses to the Gardner Area at 175<sup>th</sup> Street and I-35. We understand you may be considering approving a sign overlay district which would add some new billboards to I-35 from the south.**

**An addition of billboards on I-35 would be very helpful to the new and existing businesses at the 175<sup>th</sup> street exchange. This effort has our full support.**

**Thank you for reading this letter.**

**Sincerely,**

  
**Johnny Brown**



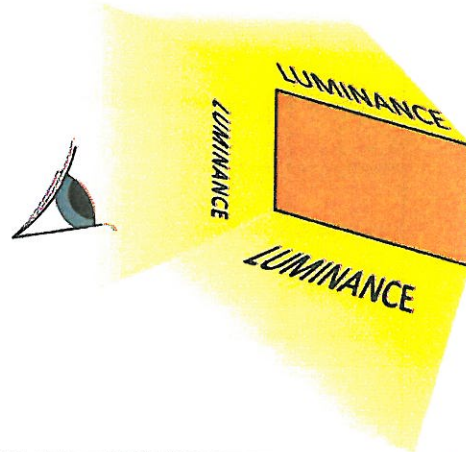
# Sign Brightness

## Measuring Sign Brightness

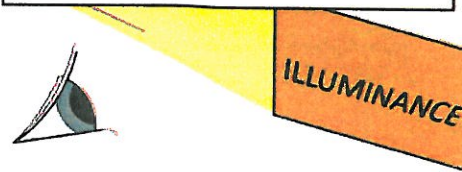
by Gregory Young

Apart from energy consumption, there are the important issues of light trespass and light pollution, which cause distraction, obscure stars in the night sky, and, like any other form of pollution, disrupt ecosystems and cause adverse health effects for humans and wildlife alike. Light trespass<sup>1</sup> is measured in two ways: luminance or illuminance. *Luminance* (measured in nits<sup>2</sup>) quantifies surface brightness, or the amount of light an object gives off. *Illuminance* (measured in footcandles<sup>3</sup>) quantifies that amount of light which falls onto an object.

By either measure, digital signage can create significant problems. "During daylight, an unlit static billboard will have a brightness which "fits in" with its surroundings; it will not cause excessive distraction because of excessive luminance" (Carhart, 2010, p.4). But, to capture drivers' attention, digital signs must be set to very high luminance levels, as they are essentially competing with the sun, which has a luminance level of 6,500 nits. If this extreme brightness is not modulated to fit nighttime conditions, we face issues including very high energy consumption during the day, light pollution in the evening, and potential driver distraction at all times. The OAAA (Outdoor Advertising Association of America) has guidelines to address brightness limits, but they are not mandated.



This sign (above) gives off light.  
Its **Luminance** is measured in **nits**.



This sign (above) is being lit by a light source.  
Its **Illuminance** is measured in **footcandles**.

<sup>1</sup> **Light trespass** occurs when unwanted light enters one's property, for instance, by shining over a neighbor's fence. A common light trespass problem occurs when a strong light enters the window of one's home from the outside

<sup>2</sup> **Nit**—term used to describe a metric unit of luminance. It is defined as candela per square meter ( $\text{cd}/\text{m}^2$ ). The unit is based on the candela, the modern metric unit of luminous intensity; and the square meter.

<sup>3</sup> **Footcandle** — Unit of light density incident on a plane (assumed to be horizontal unless otherwise specified), and measurable with an illuminance meter, a.k.a. light meter.



## Observed and Recommended Levels of Brightness

Information Source	Product type	Luminance (surface brightness)
(C. Luginbuhl study)	Typical Ambient Roadway Illumination	1 Nit
(C. Luginbuhl study)	Typical Floodlit Billboard	approximately 100 Nits
Digital Billboards: New Regulations for New Technology by Drew Carhart	Traditionally lit static billboards	98% were under 150 Nits, 83% were under 100 Nits (Arizona Study); 124 Nits average (New York Study)
IESNA recommendations	Recommendations for Digital Billboard Luminance	250 Nits (day), 125 Nits (night)
Outdoor Advertising Association of America (Ian Lewin Study)	Recommendations for Digital Billboard Luminance	300-350 Nits suggested (study based on light trespass readings)
Hewlett-Packard (Specifications)	47" LCD Digital Signage Display	500 Nits
Corn Digital (Specifications)	32" & 42" LCD Posters	500 Nits (32") 700 Nits (42")
Carhart study	Daytime sky (sunny)	5,000-7,000 Nits
Virginia Tech Transportation Inst.	The Sun	6,500 Nits
Senzen Top Technology Co., Ltd (specifications)	seires PH12 (14'x48' full-color LED billboard	8,000+ Nits
EraLED (Specifications)	Series P20 full-color LED billboard (assorted sizes)	8,500 Nits
ProVIDEO Billboard Panels (specifications)	Series 1515-4, 14'x48' full-color LED billboard	11,000+ Nits
Optec Displays (specifications)	model 1248, 14'x48' full-color LED billboard	11,000+ Nits
Optec Displays (specifications)	model 2040-5, 14'x48' full-color LED billboard	11,000+ Nits

## Limiting Sign Brightness

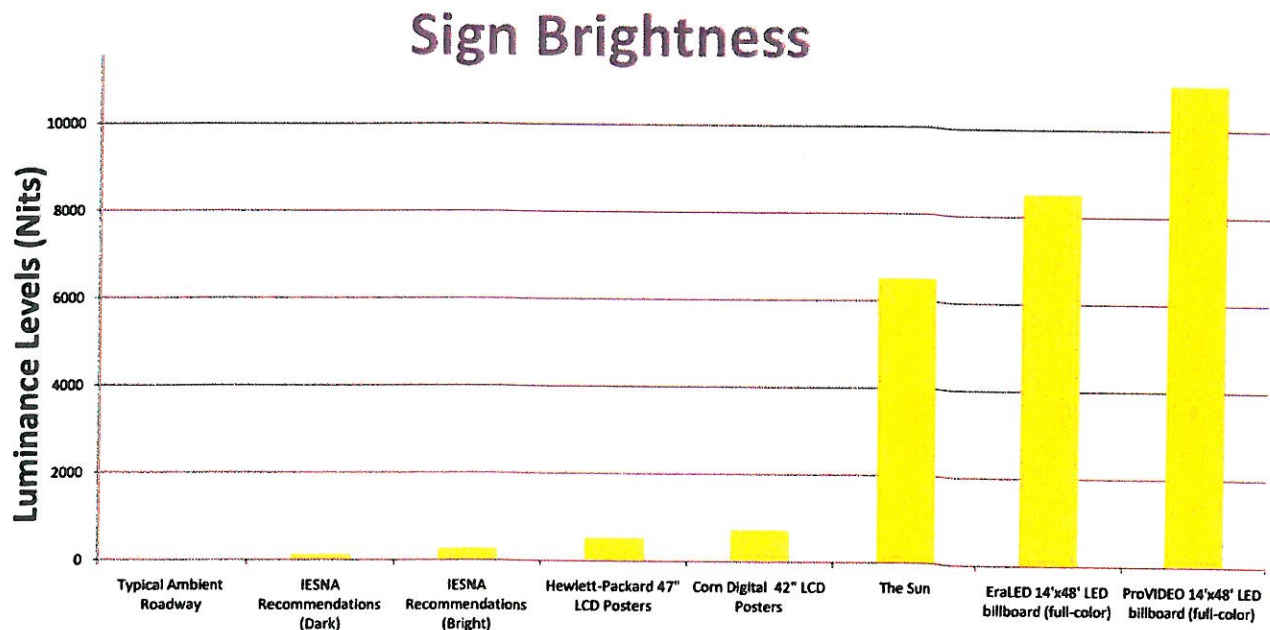
Proposed limits on sign brightness have caused much debate. Research provided by the Illuminating Engineering Society of North America (IESNA) states that drivers should be subjected to points of brightness no greater than 40 times the average brightness level of their general surroundings; this proportion is known as the contrast ratio. "As roadway lighting and automobile headlights provide ambient nighttime lighting levels of about one nit, this implies signage should appear no brighter than about 40 nits" (Luginbuhl, 2010, p.1). Surprisingly, the IESNA's own recommendations for signage luminance suggest limits between 250-1400 nits---greatly exceeding their stated maximum contrast ratio of 40:1.

The OAAA, has deemed 300-350 nits an acceptable level of night brightness. However, their guidance is based on the use of the IEEE standard for light trespass (IESNA-TM-11-00), when, for reasons of traffic safety and glare in drivers' eyes, it should have been based on IEEE's standard for roadway sign lighting (IESNA RP-19-01).

Traditionally floodlit static billboards rarely exceed 100 nits; experts on both driver distraction and light pollution recommended that, as a means of compromise, the new technologies should not exceed this value. In many areas, including Philadelphia, brightness levels are currently unregulated, and many manufacturers publicize their signs' capabilities to reach up to 11,000 nits.

Digital signage advocates mention the horizontal louvers<sup>4</sup> included in many billboards as an effective measure to prevent light pollution. In reality, these louver systems were designed primarily to shade each diode from sunlight (thus increasing their prominence), not to limit nighttime glow.<sup>5</sup> As Luginbuhl states in "Lighting and Astronomy," horizontal light (that which is emitted between 0° and roughly  $\pm 20^\circ$ , and not restricted by horizontal louvers) contributes even more to skyglow than light emitted at higher angles. The effects of lower-angle lighting---such as that used to captivate approaching drivers-- are visible over a much broader area (Carhart, 2010).

A better option is to simply operate signs at less than maximum brightness. Not surprisingly, sign brightness and energy usage are directly related; beyond reducing light pollution and distraction, lowering luminance reduces total power consumption. One manufacturer experimented with running their digital displays at half-brightness; they were able to reduce power usage by nearly 40%, while maintaining full sign readability (Noventri, see in chart). Another option for reducing unnecessary brightness (and thus power usage) is to equip signs with sensors which automatically lower light output in accordance with atmospheric conditions. For example, sign brightness would mechanically be dimmed during dusk, early morning hours, or during cloudy or overcast weather. Again, OAAA does have guidelines for dimming, but they are not mandatory.



<sup>4</sup> A **louver** is a slat that is angled to keep out rain, direct sunshine, etc. The angle of the slats may be adjustable or fixed.

<sup>5</sup>Retrieved from <http://www.optec.com>